CLAIMS

1. A radially expandable threaded tubular assembly comprising:

a radially expandable male threaded element having external male threading and a first free end, the external male threading including a first incomplete thread and a first hooked thread, the first incomplete thread being located at least adjacent the first free end of said male threaded element;

a radially expandable female threaded element having internal female threading and a second free end, the internal female threading including a second incomplete thread and a second hooked thread, the second incomplete thread being located at least adjacent the second free end of said female threaded element, said female threaded element being threadedly engaged with said male threaded element; and

an elastomeric sealant extending between the external male threading and the internal female threading and adhering to both the external male threading and the internal female threading, said elastomeric sealant capable of being elongated after curing while remaining extended between and adhered to the external male threading and the internal female threading.

2. An assembly according to claim 1, wherein said elastomeric sealant is capable of being elongated at least about 45 percent after curing while remaining extended between and adhered to each of the external male threading and the internal female threading and has an elastic modulus less than about 2.0 MPa (290 p.s.i.).

3. An assembly according to claim 1, wherein said elastomeric sealant is capable of being elongated at least about 100 percent after curing while remaining extended between and adhered to each of the external male threading and the internal female threading and has an elastic modulus less than about 1.0 MPa (145 p.s.i.).

4. An assembly according to claim 1, wherein said elastomeric sealant is capable of being elongated at least about 400 percent after curing while remaining extended between and adhered to each of the external male threading and the internal female

threading and has an elastic modulus between about 0.5 MPa (73 p.s.i.) and about 2.0 MPa (290 p.s.i.).

5. An assembly according to claim 4, wherein said elastomeric sealant is adhered to each of the external male threading and the internal female threading with an adhesion-to-rigid-substrate of at least 0.35 MPa (51 p.s.i.).

6. An assembly according to claim 4, wherein said elastomeric sealant is adhered to each of the external male threading and the internal female threading with an adhesion-to-rigid-substrate of at least 0.7 MPa (102 p.s.i.).

7. An assembly according to claim 6, wherein said elastomeric sealant is a greaseless elastomeric sealant.

8. An assembly according to claim 7, wherein said greaseless elastomeric sealant is capable of curing in the absence of oxygen and in the absence of humidity.

9. An assembly according to claim 8, wherein said greaseless elastomeric sealant is a polysulfide sealant or a polyurethane sealant.

10. An assembly according to claim 9, wherein said greaseless elastomeric sealant is a viscous paste or a liquid before curing and is a rubber-like solid after curing.

11. An assembly according to claim 1, wherein said male threaded element and said female threaded element threadedly engage each other to form a flush joint connection.

12. An assembly according to claim 11, wherein each of the first incomplete thread and the second incomplete thread has a perfect crest and an imperfect root.

13. An assembly according to claim 12, wherein each of the first incomplete thread and the second incomplete thread is also a hooked thread.

14. An assembly according to claim 13, wherein the first incomplete thread is the initial thread adjacent the first free end of said male threaded element, and the second incomplete thread is the initial thread adjacent the second free end of said female threaded element.

15. An assembly according to claim 14, wherein at least one of said male threaded element and said female threaded element includes a torque shoulder.

16. An assembly according to claim 15, wherein the torque shoulder is a reverse torque shoulder.

17. A radially expandable threaded tubular assembly comprising:

a radially expandable male threaded element having external male threading and a first free end, the external male threading including a first incomplete thread and a first hooked thread, the first incomplete thread being located at least adjacent the first free end of said male threaded element;

a radially expandable female threaded element having internal female threading and a second free end, the internal female threading including a second incomplete thread and a second hooked thread, the second incomplete thread being located at least adjacent the second free end of said female threaded element;

a first metallic coating disposed on and adhered to the external male threading; and

a second metallic coating disposed on and adhered to the internal female threading, wherein said female threaded element is threadedly engaged with said male threaded element and said first metallic coating is cold welded to said second metallic coating.

18. An assembly according to claim 17, wherein each of said first metallic coating and said second metallic coating is a ductile metal and has a yielding tension less than about 100 MPa (14.5 k.s.i.).

19. An assembly according to claim 17, wherein each of said first metallic coating and said second metallic coating is a ductile metal and has a yielding tension less than about 20 MPa (2.9 k.s.i.).

20. An assembly according to claim 19, wherein each of said first metallic coating and said second metallic coating allows a principal shear strain of at least about 100 percent without fracturing and without fissure propagation.

21. An assembly according to claim 17, wherein one of said first metallic coating and said second metallic coating is an alloy, and the other of said first metallic coating and said second metallic coating is an alloy or a pure metal.

22. An assembly according to claim 17, wherein each of said first metallic coating and said second metallic coating is a pure metal.

23. An assembly according to claim 22, wherein the pure metal contains 99.99 percent by weight of a single metal.

24. An assembly according to claim 23, wherein the single metal is selected from the group consisting of Copper, Aluminum, Lead, Zinc, Tin and Magnesium.

25. An assembly according to claim 23, wherein the single metal is selected from the group consisting of Lead, Zinc and Tin.

26. An assembly according to claim 25, wherein each of said first metallic coating and said second metallic coating has a thickness at least about one-sixteenth of a gap between the engaged internal female threading and the external male threading.

27. An assembly according to claim 26, wherein each of said first metallic coating and said second metallic coating has substantially the same thickness and is of the same pure metal.

28. An assembly according to claim 26, wherein at least one of said first metallic coating and said second metallic coating has a varying thickness, and each of said first metallic coating and said second metallic coating is of the same pure metal.

29. An assembly according to claim 17, wherein said radially expandable male threaded element and said radially expandable female threaded element threadedly engage each other to form a flush joint connection.

30. An assembly according to claim 29, wherein each of the first incomplete thread and the second incomplete thread has a perfect crest and an imperfect root.

31. An assembly according to claim 30, wherein each of the first incomplete thread and the second incomplete thread is also a hooked thread.

32. An assembly according to claim 31, wherein the first incomplete thread is the initial thread adjacent the first free end of said male threaded element, and the second incomplete thread is the initial thread adjacent the second free end of said female threaded element.

33. An assembly according to claim 32, wherein at least one of said male threaded element and said female threaded element includes a torque shoulder.

34. An assembly according to claim 33, wherein the torque shoulder is a reverse torque shoulder.

35. A method of forming a sealed tubular joint, said method comprising the steps of:

providing a first radially expandable tubular member having external male threading and a first free end, the external male threading including a first incomplete thread and a first hooked thread, the first incomplete thread being located at least adjacent the first free end of the first tubular member;

providing a second radially expandable tubular member having internal female threading and a second free end, the internal female threading including a second incomplete thread and a second hooked thread, the second incomplete thread being located at least adjacent the second free end of the second tubular member;

coating at least one of the external male threading and the internal female threading with an elastomeric sealant;

coupling the first tubular member and the second tubular member, said coupling thereby providing a threaded connection;

disposing the elastomeric sealant between the external male threading and the internal female threading and into adherence with each of the external male threading and the internal female threading;

curing the elastomeric sealant, said curing thereby providing a cured elastomeric sealant extended between and adhered to the external male threading and the internal female threading; and

radially expanding the threaded connection, wherein the cured elastomeric sealant is capable of being elongated while remaining extended between and adhered to the external male threading and the internal female threading.

36. A method according to claim 35, wherein the threaded connection is radially expanded at least about five percent based on an inside diameter of the threaded connection.

37. A method according to claim 35, wherein the threaded connection is radially expanded at least about fifteen percent based on an inside diameter of the threaded connection.

38. A method according to claim 35, wherein the elastomeric sealant is a greaseless elastomeric sealant, each of the external male threading and the internal female threading is coated with the greaseless elastomeric sealant in said coating step, and the cured elastomeric sealant (i) is capable of being elongated at least about 400 percent while remaining extended between and adhered to the external male threading and the internal female threading, (ii) is adhered to each of the external male threading and the internal female threading with an adhesion-to-rigid-substrate of at least 0.7 MPa (102 p.s.i.); and (iii) has an elastic modulus between about 0.5 MPa (73 p.s.i.) and about 2.0 MPa (290 p.s.i.).

39. A method according to claim 38, wherein the greaseless elastomeric sealant is (i) a polysulfide sealant or a polyurethane sealant, (ii) a viscous paste or a liquid before said curing, and (iii) a rubber-like solid after said curing.

40. A method according to claim 35, wherein (i) the threaded connection is a flush joint connection, (ii) each of the first incomplete thread and the second incomplete thread has a perfect crest and an imperfect root, (iii) each of the first incomplete thread and the second incomplete thread is also a hooked thread, (iv) the first incomplete thread is the initial thread adjacent the first free end of the first tubular member and the second incomplete thread is the initial thread adjacent the second free end of the second tubular member, and (v) at least one of the first tubular member and the second tubular member includes a reverse torque shoulder.

41. A method of forming a sealed tubular joint, said method comprising the steps of:

providing a first radially expandable tubular member having external male threading and a first free end, the external male threading including a first incomplete

thread and a first hooked thread, the first incomplete thread being located at least adjacent the first free end of the first tubular member;

providing a second radially expandable tubular member having internal female threading and a second free end, the internal female threading including a second incomplete thread and a second hooked thread, the second incomplete thread being located at least adjacent the second free end of the second tubular member;

coating the external male threading with a first metallic coating, the first metallic coating being a first pure metal and adhering to the external male threading;

coating the internal female threading with a second metallic coating, the second metallic coating being a second pure metal and adhering to the internal female threading;

coupling the first tubular member and the second tubular member, said coupling thereby providing a threaded connection, said coupling cold welding the first metallic coating together with the second metallic coating; and

radially expanding the threaded connection, wherein after said radial expansion of the threaded connection (i) the first metallic coating remains adhered to the external male threading, (ii) the second metallic coating remains adhered to the internal female threading, and (iii) the first metallic coating and the second metallic coating remain cold welded together.

42. A method according to claim 41, wherein the threaded connection is radially expanded at least about five percent based on an inside diameter of the threaded connection.

43. A method according to claim 41, wherein the threaded connection is radially expanded at least about fifteen percent based on an inside diameter of the threaded connection.

44. A method according to claim 41, wherein (i) each of the first pure metal and the second pure metal contains 99.99 percent by weight of a single metal selected from the

group consisting of Copper, Aluminum, Lead, Zinc, Tin and Magnesium, (ii) the threaded connection is a flush joint connection, (iii) each of the first incomplete thread and the second incomplete thread has a perfect crest and an imperfect root, (iv) each of the first incomplete thread and the second incomplete thread is also a hooked thread, and (v) at least one of the first tubular member and the second tubular member includes a reverse torque shoulder.

45. An expandable sealed tubular joint comprising:

a pair of radially expandable elements each having threading at a free end thereof and coupled to one another, the threading including hooked incomplete threads being located at least adjacent the free ends; and

a sealing substance extending between and adhering to the threading of one radially expandable element and the threading of the other radially expandable element, wherein after a radial expansion of said coupled pair of radially expandable elements said sealing substance remains extended between and adhered to the threading of one radially expandable element and the threading of the other radially expandable element.

46. A joint according to claim 45, wherein said sealing substance is a greaseless elastomeric sealant that (i) is capable of being elongated at least about 100 percent while remaining extended between and adhered to the threading of one radially expandable element and the threading of the other radially expandable element, (ii) is adhered to the threading with an adhesion-to-rigid-substrate of at least 0.35 MPa (51 p.s.i.); and (iii) has an elastic modulus between about 0.5 MPa (73 p.s.i.) and about 2.0 MPa (290 p.s.i.).

47. A joint according to claim 45, wherein said sealing substance is a pure metal containing 99.99 percent by weight of a single metal selected from the group consisting of Copper, Aluminum, Lead, Zinc, Tin and Magnesium, said coupled pair of radially expandable elements form a flush joint connection, and the hooked incomplete threads have perfect crests and imperfect roots.